

CLAIMS

What is claimed is:

1 1. A method for improving detection of a watermark, comprising:
2 generating a pseudo-random sequence of numbers based on data associated with a
3 data set;
4 producing the watermark based on the pseudo-random number sequence; and
5 embedding the watermark into the data set.

1 2. The method of claim 1 further comprising:
2 repeatedly performing arithmetic operations on signal values associated with different
3 regions of the data set to produce a plurality of resultant signal values;
4 determining sign bits associated with the plurality of resultant signal values; and
5 providing the sign bits as the pseudo-random number sequence.

1 3. The method of claim 1, wherein the generating of the pseudo-random number
2 sequence comprises:
3 computing a mean signal value for a first region of the data set;
4 computing a mean signal value for a second region of the data set;
5 performing an arithmetic operation on the mean signal value of the first region and
6 the mean signal value of the second region to produce a resultant signal value;
7 determining a sign bit of the resultant signal value; and
8 providing the sign bit as a portion of the pseudo-random number sequence.

1 4. The method of claim 3, wherein the performing of the arithmetic operation
2 includes computing a difference between the mean signal value of the first region and the
3 mean signal value of the second region.

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1 5. The method of claim 4, wherein each region of the data set includes a
2 predefined image within the frame.

1 6. The method of claim 1, wherein the producing of the watermark includes
2 computing a data block having an amplitude for the watermark;
3 computing a secondary data set, each pixel of the secondary data set having a
4 predetermined signal value; and
5 multiplying the pseudo-random number sequence, the amplitude and the secondary
6 data set to produce the watermark.

1 7. The method of claim 6, wherein the amplitude for the watermark is computed
2 through adjustment of a plurality of parameters including frame differences.

1 8. A method for extracting a watermark from a video sequence, comprising:
2 receiving the video sequence having a first frame embedded with a watermark; and
3 recovering the watermark within the first frame through analysis of intensity
4 differences between the first frame of the video sequence and a second frame of the video
5 sequence.

1 9. The method of claim 8, wherein prior to recovering the watermark, the
2 method further comprises:

3 computing a pseudo-random number sequence using the random number generator
4 seed

1 10. The method of claim 9, wherein the recovering of the watermark includes:
2 computing a sum for products of (i) differences between watermarked intensities of
3 the first frame and the second frame of the video sequence and (ii) corresponding elements
4 of the pseudo-random number sequence.

1 11. The method of claim 10, wherein the recovering of the watermark further
2 includes:

3 computing a products of (i) a mean value for the differences between watermarked
4 intensities of the first frame and the second frame of the video sequence and (ii) a sum of the
5 pseudo-random number sequence.

1 12. The method of claim 11, wherein the recovering of the watermark further
2 includes:

3 subtracting (i) the product of the mean value for the differences between watermarked
4 intensities of the first frame and the second frame of the video sequence and the sum of the
5 pseudo-random number sequence from (ii) the sum of products of the differences between
6 watermarked intensities of the first frame and the second frame of the video sequence and the
7 corresponding elements of the pseudo-random number sequence.

1 13. A method comprising:
2 receiving a portion of a watermarked sequence of data; and
3 extracting a watermark from a segment of the portion sequence of data without
4 having access to either an original sequence of data or the entire watermarked sequence of
5 data.

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14. The method of claim 13, wherein the sequence of data includes a video sequence.

15. The method of claim 13, wherein the portion of the sequence of data includes at least one frame of video.

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